

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The information disclosure statement filed 11/15/05 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because the following is not provided: 1) a legible copy of each cited foreign patent document, and 2) a concise explanation of the relevance for the non-English documents and/or a written translation of the non-English language documents, or a portion thereof. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a). (NOTE: the search report filed on 11/15/05 is insufficient to determine the relevance of the references.)

### ***Title***

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Rain Sensor with Ambient Light Compensation.

### ***Claim Objections***

**Claim 2, line 8:** insert -- out a -- after “separating”.

**Claim 7** recites the limitation "the fluctuating outside-light component" in line 3. There is insufficient antecedent basis for this limitation in the claim.

**Claim 12, line 7:** insert -- out a -- after “separating”.

**Claim 23, line 6:** insert -- out -- after “filtering”.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claim 11 is rejected under 35 U.S.C. 102(b) as being anticipated by Applicant’s**

**Admitted Prior Art Figures 1 and 2 (hereinafter “AAPA”).**

**Regarding claim 11, AAPA** discloses a signal detecting method in which a pulse light is irradiated from a light emitting element (10) to a windshield (16) of a vehicle, a reflected light is received by a light receiving element (20), the pulse signal from the light receiving element is processed and inputted to a processing unit (22) in order to control a wiper of the vehicle, comprising the steps of: converting the pulse signal from said light emitting element to a voltage signal (24); reducing an outside light component included in said voltage signal converted (from prism 14); and reducing a noise of said voltage signal and amplifying the voltage signal (26).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**Claims 1-7, 10-25, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Scheremeta (U.S. 6,066,843).**

**Regarding claims 1 and 11,** *AAPA* teaches a signal detecting circuit and corresponding method which irradiates a pulse light from a light emitting element (10) to a windshield (16) of a vehicle, receives a reflected light by a light receiving element (10), processes the pulse signal from the light receiving element and inputs it to a processing unit (22) in order to control a wiper of the vehicle, comprising: a current-voltage converter circuit (24) for converting the pulse signal from said light emitting element to a voltage signal; and a band-pass filter circuit/amplifier circuit (26) for reducing a noise of the output signal of said current-voltage converter circuit and for amplifying the output signal. *AAPA* does not teach an outside-light component reducing circuit provided in parallel with said current-voltage converter circuit for reducing an outside light component included in an output signal of said current-voltage converter circuit.

*Scheremeta* (Figure 4; column 7, lines 5-20) teaches an outside-light component reducing circuit (218) provided in parallel with a current-voltage converter circuit (208) for reducing an outside light component included in an output signal of said current-voltage converter circuit. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the

outside-light component reducing circuit of *Scheremeta* in *AAPA* to remove fluctuations of ambient light and prevent saturation of the current-voltage converter.

**Regarding claims 2, 12, 19, and 23,** *AAPA* teaches a signal detecting circuit and corresponding method which irradiates a pulse light from a light emitting element (10) to a windshield (16) of a vehicle, receives a reflected light by a light receiving element (20), processes the pulse signal from the light receiving element and inputs it to a processing unit (22) in order to control a wiper of the vehicle, comprising: a current-voltage converter circuit (24) for converting the pulse signal from said light emitting element to a voltage signal; and a band-pass filter circuit/amplifier circuit (26) for reducing a noise of the output signal of said current-voltage converter circuit and for amplifying the output signal. *AAPA* does not teach an outside-light component reducing circuit provided in parallel with said current-voltage converter circuit for separating frequency of an outside light component included in an output signal of said current-voltage converter circuit and feeding it back (i.e. adding it) to the input side of said current-voltage converter circuit. *Scheremeta* (Figure 4; column 7, lines 5-20) teaches an outside-light component reducing circuit (218) provided in parallel with a current-voltage converter circuit (208) for separating frequency of an outside light component included in an output signal of said current-voltage converter circuit and feeding it back to the input side of said current-voltage converter circuit. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the outside-light component reducing circuit of *Scheremeta* in *AAPA* to remove fluctuations of ambient light and prevent saturation of the current-voltage converter.

**Regarding claims 6, 15, 25, and 28,** *AAPA* teaches a signal detecting circuit and corresponding method which irradiates a pulse light from a light emitting element (10) to a

windshield (16) of a vehicle, receives a reflected light by a light receiving element (20), processes the pulse signal from the light receiving element and inputs it to a processing unit (22) in order to control a wiper of the vehicle, comprising: a current-voltage converter circuit (24) for converting the pulse signal from said light emitting element to a voltage signal; and a band-pass filter circuit/amplifier circuit for reducing a noise of the output signal of said current-voltage converter circuit and for amplifying the output signal. *AAPA* does not teach an outside-light component reducing circuit provided in parallel with said current-voltage converter circuit for holding a constant outside light component included in an output signal of said current-voltage converter circuit and feeding it back to the input side of said current-voltage converter circuit. *Scheremeta* (Figure 4; column 7, lines 5-20) teaches an outside-light component reducing circuit (218) provided in parallel with a current-voltage converter circuit (208) for holding a constant outside light component (i.e. continuous flashlight outside) included in an output signal of said current-voltage converter circuit and feeding it back (i.e. adding) to the input side of said current-voltage converter circuit. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the outside-light component reducing circuit of *Scheremeta* in *AAPA* to remove fluctuations of ambient light and prevent saturation of the current-voltage converter.

**Regarding claims 3, 13, and 20, *AAPA* as modified by *Scheremeta* (*Scheremeta*, Figure 4) teaches that said outside-light component reducing circuit includes a low-pass filter circuit for passing said outside light component, and an outside-light component voltage-current converter circuit for converting said passed outside light component to an electric current and feeding it back to the input side of said current-voltage converter circuit (since the output for the outside-**

light component reducing circuit is rejoined with the current output of the photodiode, it must be converted back into a current).

**Regarding claims 4, 10, 21, and 27, *AAPA as modified by Scheremeta (AAPA)*** teaches that said light emitting element (10) is a light emitting diode and said light receiving element (20) is a photodiode.

**Regarding claims 5, 14, 22, and 24 *AAPA as modified by Scheremeta (Scheremeta, Figure 4)*** teaches that said outside light component includes a constant outside light component and a fluctuating outside light component.

**Regarding claim 7, *AAPA as modified by Scheremeta (AAPA)*** teaches a band-pass filter circuit/amplifier circuit for reducing noise, but does not teach a low-pass filter circuit is further provided inside said band-pass filter circuit/amplifier circuit for reducing a high frequency component of the fluctuating outside-light component. It is known in the art to use a specific type of filter, such as a low-pass filter, to reduce noise. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a low-pass filter in *AAPA as modified by Scheremeta* based on the frequencies of the unwanted wavelengths.

**Regarding claim 16, *AAPA as modified by Scheremeta (Scheremeta, Figure 4)*** teaches that the step for feeding back said outside light component includes a step for holding the voltage of the outside light component; and a step for converting the held voltage to an electric current and adding the converted current to said pulse signal (since the output for the outside-light component reducing circuit is rejoined with the current output of the photodiode, it must be converted back into a current).

**Regarding claim 17**, *AAPA as modified by Scheremeta (Scheremeta, Figure 4)* teaches a step for reducing a high frequency component of a fluctuating outside-light component (i.e. when flashlight is not constant).

**Regarding claim 18**, *AAPA as modified by Scheremeta (Scheremeta, Figure 4)* teaches that the step for feeding back said outside light component includes a step for holding the voltage of the outside light component; and a step for converting the held voltage to an electric current and adding the converted current to said pulse signal (since the output for the outside-light component reducing circuit is rejoined with the current output of the photodiode, it must be converted back into a current).

***Allowable Subject Matter***

**Claims 8, 9 and 26** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

**Regarding claims 8 and 9**, the cited prior art of record does not teach or fairly suggest a signal detecting circuit comprising, along with the other claimed features, said outside-light component reducing circuit includes a switch circuit connected to the output side of said current-voltage converter circuit, an outside-light component voltage holding circuit connected to said switch circuit for holding the voltage of an outside light component, and an outside-light component voltage-current converter circuit connected to said outside-light component holding circuit for converting the held voltage to an electric current and feeding it back to the input side of said current-voltage converter circuit.

**Regarding claim 26**, the cited prior art of record does not teach or fairly suggest an outside-light component reducing circuit comprising, along with the other claimed features, a switch circuit connected to the output side of said current-voltage converter circuit; an outside-light component voltage holding circuit connected to said switch circuit for holding the voltage of the outside light component; and an outside-light component voltage-current converter circuit connected to said outside-light component voltage holding circuit for converting the held voltage to an electric current and feeding it back to the input side of said current-voltage converter circuit.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 571-272-1945. The examiner can normally be reached on Monday through Friday 10-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Davienne Monbleau/  
Primary Examiner, Art Unit 2878